



DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
WATER QUALITY MONITORING AND ASSESSMENT SECTION
WATERSHED INFORMATION SHEET

Table Rock Lake Basin-11010001

Basin Description

The Table Rock Lake basin lies in southwestern Missouri and Northwestern Arkansas. The Missouri portion of the basin includes all of Table Rock Lake and several small direct tributaries, the largest of which is Roaring River. Table Rock Lake is the second in a series of four reservoirs that impounds a large section of the White River. Table Rock receives most of its water from Beaver Reservoir in Arkansas, which is immediately upstream of Table Rock Lake. Other major tributaries are the James River in Missouri and the Kings River in Arkansas. Discharges from Table Rock dam flow into Lake Taneycomo.

The Missouri portion of the basin is 382 square miles in area. Fifty-eight percent of this area is in forest, 28 percent pasture and hayfields and 13 percent is water. Table Rock Lake has an area of 43,100 acres. In Missouri, only Lake of the Ozarks and Truman Lake are larger. None of the streams or lakes in the basin is used as a source of public drinking water supply.

Average annual rainfall is 43 inches. Stream flow statistics for the basin are shown in Table 1.

Table 1. Stream Flow Statistics for the Table Rock Lake Basin

Stream/Location	Wtrshd. Area (sq.mi.)	Period Of Record	Flow (cfs)				
			90 th Percentile *	Mean	Median **	10 th Percentile ***	7Q10 Low Flow+

*Flow is less than this amount 90 percent of the time

**Flow is less than this amount 50 percent of the time

***Flow is less than this amount 10 percent of the time

+ The lowest average seven consecutive day flow that occurs with a recurrence interval of 10 years.

The surface of the basin is composed of Mississippian age limestone in the uplands and Ordovician age dolomites in the stream valleys. The Burlington limestone, from which so many spring systems are developed in the James River basin, thins rapidly as it nears the Table Rock Lake area. As a result, there is only one spring of note in the basin, albeit a large one, Roaring River Spring which has an average flow of 31.6 cfs. This spring supports a trout hatchery, an active trout fishery downstream of the hatchery and is the central feature of a state park.

Water Quality of Missouri Springs

<http://www.dnr.mo.gov/env/wpp/watersheds/info/wq-missouri-springs.pdf>

Table Rock Lake has a total storage capacity of 3.46 million acre feet (maf), comprised of a 2.7 maf conservation and power pool and a 0.76 maf flood pool. The reservoir impounds 80 miles of the White River and has a shoreline of 860 miles. The dam has four 50,000-kilowatt hydroelectric generating units.

Water Quality Concerns

Acceptable water quality is defined by Missouri's Water Quality Standards [<http://www.sos.mo.gov/adrules/csr/current/10csr/10c20-7a.pdf>]. Streams or lakes that do not meet these standards are considered "impaired". They may not be fit for certain uses such as swimming, drinking water supply or protection of fish and other aquatic life. Waters are considered to be "affected" rather than "impaired" if water quality changes are less serious and state standards are not exceeded. These standards also list more than 3,600 classified streams and more than 400 classified lakes in the state. A classified stream is one that is either a permanently flowing stream or one that may stop flowing in dry weather but still maintains large pools of water that support aquatic life. Unclassified streams are small tributaries to classified streams. They typically have flowing water only during wet weather and are dry for the remainder of the year.

Point Source Pollution

Point source pollution is a discharge of wastewater from a single location such as a wastewater treatment plant. Wastewater treatment plants can serve industries, small businesses, subdivisions, mobile home parks, apartment complexes, or entire cities. Wastewater from residential sources such as subdivisions, apartments and mobile home parks is often referred to as "domestic wastewater." It contains primarily treated human wastes, food wastes and detergents. The primary pollutants of concern in domestic wastewater are the amount of organic matter, which is commonly reported as Biological Oxygen Demand (BOD), suspended solids, and ammonia. Industrial and commercial wastewater can be more complex and may contain, in addition to domestic wastes, heavy metals or man-made organic chemicals that can be potentially toxic. Discharges from most municipal wastewater treatment plants are usually a mixture of domestic and industrial/commercial wastewater. Most wastewater plant discharges are also typically high in nitrogen and phosphorus, two elements that act as fertilizers and can cause excessive algae growth in waters receiving these discharges.

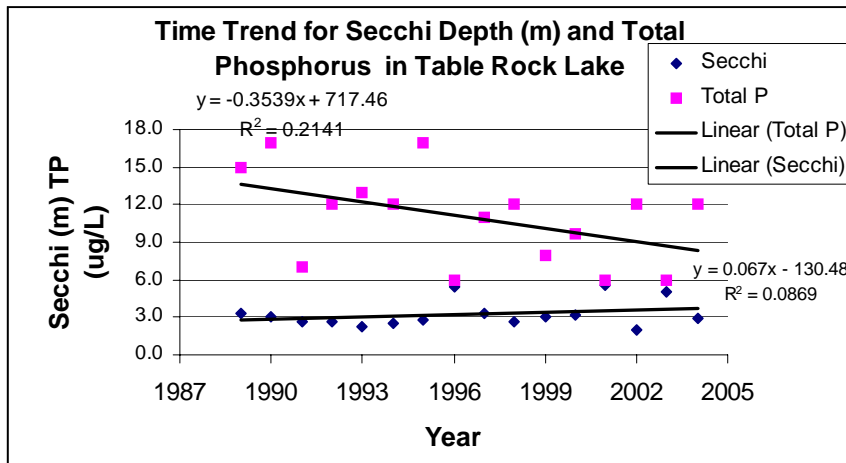
There are 98 permitted domestic or industrial/commercial point sources that discharge a combined 1.68 million gallons per day (mgd) of treated wastewater into the waters of the this basin. There are 46 miles of classified streams in the basin, none of which are known to be affected or impaired by point source wastewater discharges. There are 0.1 miles of unclassified streams affected or impaired by point source wastewater discharges.

Because of its scenery and recreational opportunities, the very long shoreline of Table Rock lake has become a common place for residential and commercial development.

Most wastewater discharges in the basin are directly to or very near to the shoreline of Table Rock Lake. Most of these discharges are small domestic wastewater plants serving businesses or small residential developments in the immediate vicinity of the lake. In addition to these, there are many single family residences that have individual on-site waste treatment systems, usually septic tanks, that are located very near the lake. With this type of distribution, there are few opportunities for centralized sewer systems and large regional wastewater treatment plants. Thus, local communities, via an organization called Table Rock Lake Water Quality Inc., are now stressing the proper construction, maintenance and operation of the many small wastewater discharges to help protect water quality in the lake.

Table Rock Lake Water Quality Inc.

<http://www.trlwq.org/2002-1%20newsletter.pdf>



State regulations now limit point source phosphorus discharges in the Missouri portion of the Table Rock Lake watershed, including the James River basin. Improvements at the Springfield SW WWTP have substantially reduced phosphorus from this source. As the graph

above shows, over the last few years, there has been a trend of decreasing phosphorus and increased water clarity in the lake.

Wastewater Treatment

<http://www.dnr.mo.gov/env/wpp/watersheds/info/wastewater-treatment.pdf>

Springfield Southwest Wastewater Treatment Plant

http://www.ci.springfield.mo.us/egov/publicworks/sanitary/sw_plant.html

Nonpoint Source Pollution

The basin is predominantly forested and has very little cultivated land. Sheet erosion is estimated at 2.5-5 tons/acre/year and gully erosion at 0-0.16 tons/acre/year. Thus, there are no basin-wide nonpoint source problems.

Developed areas near Table Rock Lake probably have bacterial contamination of shallow groundwater. In adjacent and geologically similar Taney County, it was found that most springs and streams in residential or commercial areas showed evidence of sewage

contamination. Other localized areas of concern include the portion of the Aunt's Creek watershed near the Renfro landfill that may have some leachate discharge to receiving streams or shallow groundwater. The western rim of the basin is now being used for poultry production and land application of poultry litter, which may result in elevated levels of bacteria and nutrients in area streams.

Water Quality Management

The department achieves water quality management of point source pollutants through the issuance and enforcement of wastewater discharge permits. These permits limit the amount of pollutants that can be discharged. All point source wastewater dischargers must obtain a permit and adhere to its discharge limitations. All permits require at least a level of treatment equal to national wastewater treatment standards. In situations where these national treatment standards are not adequate to protect the streams or lakes receiving these wastewater discharges, stricter permit limits that do protect these waters are required. The permits require regular monitoring and reporting of discharge quality. The department also conducts regular inspection of wastewater treatment facilities and receiving waters.

Nonpoint source pollution is addressed through the state's nonpoint source management plan. This plan is a cooperative program between the Department of Natural Resources and other federal, state and local government agencies or organizations, local landowners and other interested citizens. The plan emphasizes addressing problems at the watershed level through the use of management practices that control nonpoint pollution. The most commonly supported practices are those that control soil erosion on agricultural and urban lands, improve quality and quantity of forage on grazing lands, protect riparian zones, and those that control runoff of animal manures, fertilizers and pesticides. The state nonpoint source management plan is a voluntary program that provides funds to help defray the cost of adopting management practices.

Table 3. Nonpoint Source Watershed Projects in the Basin

Watershed Name	County	Project Date	Watershed Size (Acres)	Acres Treated	Percent of Watershed Treated

The Missouri Department of Natural Resources monitors water chemistry and aquatic invertebrate communities at many locations in Missouri. The department also tracks the quality of domestic, industrial and storm water discharges. These monitoring activities

provide information on water quality problems, such as their specific location, pollutants, sources and possible solutions. This information guides the management activities the department takes to protect water quality in Missouri.

Web links

US Geological Survey <http://mo.water.usgs.gov/>